



Physical Sciences Seminar

Exotic charge carriers in porous frameworks, and their applications

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Host: Maria Ibanez

In this presentation, I discuss how to design Metal- and Covalent Organic Frameworks with superconducting and topological charge carriers. Integrating theory and high-level computation with experiment, I cross the boundaries between chemistry and physics, and demonstrate how the porosity of these materials can be employed for novel applications. In the first part, I present a strategy to engineer superconductivity through an effective use of the pore space in a Covalent Triazine Framework, CTF-0. I analyse the effects of doping CTF-0 with Li and Na, and describe the performance of the decorated frameworks as superconductors. I will show how CTFs and kindred porous frameworks can be a hub for an exciting new class of materials, for which tunable porosity gives control over superconducting properties. In the second part, I discuss my recent discovery of topological Metal-Organic Framework (tMOF) semimetals. The tMOFs present a first class of materials with topologically protected states at interior surfaces, and offer control over the specific surface area over which the charge carriers move. I discuss how this brings new possibilities for sustainable catalysis.

Monday, January 20, 2020 10:00am - 11:00am

Mondi Seminar Room 2, Central Building



This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.

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<https://ista.ac.at/en/campus/how-to-get-here/> The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.